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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 2010828PC/or	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/FI2003/000232	International filing date (day/month/year) 26.03.2003	Priority date (day/month/year) 27.03.2002
International Patent Classification (IPC) or national classification and IPC C13K 13/00, C13D 3/14, C13J 1/06 // B01J 41/06		
Applicant DANISCO SWEETENERS OY et al		

- This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 4 sheets, including this cover sheet.
- This report is also accompanied by ANNEXES, comprising:
 - ☐ (sent to the applicant and to the International Bureau) a total of _____ sheets, as follows:
 - ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

- This report contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the report |
| <input type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |

Date of submission of the demand 10.09.2003	Date of completion of this report 07.07.2004
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. +46 8 667 72 88	Authorized officer Eva Johansson/EÖ Telephone No. +46 8 782 25 00

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/FI2003/000232

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

- ☐ This report is based on a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

- ☒ the international application as originally filed/furnished
- ☐ the description:
- pages _____ as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☐ the claims:
- pages _____ as originally filed/furnished
- pages* _____ as amended (together with any statement) under Article 19
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☐ the drawings:
- pages _____ as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to the sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to the sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/FI2003/000232

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	<u>1-32</u>	YES
	Claims		NO
Inventive step (IS)	Claims	<u>1-32</u>	YES
	Claims		NO
Industrial applicability (IA)	Claims	<u>1-32</u>	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

The following documents cited in the search report:

D1) WO 0227030 A1
D2) Patent abstract of Japan JP 2001128700
D3) Patent abstract of Japan JP 11221100
D4) WO 0227037 A1
D5) WO 0227038 A1
D6) WO 0042225
D7) STN International, File CAPLUS, CAPLUS accession no. 1983:85591, document no. 98:85591
D8) STN International, File CAPLUS, CAPLUS accession no. 1982:541125, document no. 97:141125
D9 US 5482631 A

The problem to be solved by the present application is to separate sugars, sugar alcohol, other carbohydrates and mixtures thereof from a solution containing at least two of them. This is done by a method which comprises at least one step in which a weakly basic anion exchange resin is used in the chromatographic separation.

D6, which is considered to be the closest prior art, discloses a method for separating a carbohydrate selected from the group consisting of monosaccharides, from an aqueous phase comprising the carbohydrate and at least one other component consisting of a sugar and a sugar alcohol. The method comprises the step of passing the aqueous phase over a strongly basic anion exchange resin (see page 7).

.../...

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: Box V

The claimed process and the known process both solve the problem to separate sugars, sugar alcohol, other carbohydrates and mixtures thereof.

The claimed invention differs from D6 in that a weakly basic anion exchange resin is used in the process.

The problem to be solved by the present invention may therefore be regarded as using weakly basic anion exchange resin in a separation process to separate sugars and sugar alcohols from each other without resulting in the decomposition of reducing sugars. This was not obvious to a person skilled in the art.

Thus, there is no indications in the prior art that would lead a person skilled in the art to apply the features from the cited document and thus arrive at the invention as defined in claims 1-32. Therefore, the invention according to claims 1-32 fulfils the requirements of novelty and inventive step. The invention is industrially applicable.

The cited documents D1-D5 and D7-D9 only disclose the general state of the art, and are not considered to be of particular relevance.